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COUNTRY ANALYSIS BRIEFS

Ukraine

Last Updated: March 2006

Background

Ukraine is important to world energy markets because it is a critical transit center for exports of Russian oil and natural gas to Europe, as well as a significant energy consumer in its own right.

The Ukrainian economy grew by roughly 12.1 percent in 2004, but preliminary data indicate a slowdown in growth to 2.4 percent in 2005. Following an eight-year post-Soviet recession, 2005 marked the country's sixth consecutive year of economic growth. Economic expansion has been fueled primarily by growing industrial and agricultural output— exported both eastwards to Russia and westwards to Europe. Ukraine's geographic position, linking East and West, while also holding critical warm water ports on the Black Sea, has made the country a trade link of growing importance between the former Soviet Union and Europe.

With the recent additions of some of Ukraine's neighboring countries into the EU, the country's economic role has grown. Following a similar designation by the EU in December 2005, the United States granted Ukraine "market status" in February 2006. The is the first symbolic step toward greater integration with the EU, and market economy status will help Ukraine defend itself from accusations of illegal dumping products cheaply in the EU market that have led to costly punitive damages.

Reorienting trade towards Europe and Asia has resulted in an improved macroeconomic environment and an increased level of public trust in market institutions. Privatized companies have greatly contributed to the broad-based improvements in manufacturing, retail trade, agriculture, and construction. Following the so-called Orange Revolution in November 2004, then-Prime Minister Yulia Tymoshenko pledged to review around 3,000 privatization deals that had occurred during the previous president's term. The review added to investor uncertainty and dampened the high rates of economic growth seen during 2004. With lower agricultural and manufacturing revenues, investors had less incentive to invest in upgrading their production capacity. President Yushchenko has continued to review the Soviet era privatizations and has approved the resale of the Kryvorizhstal steel complex, one of the largest privatization deals in the Former Soviet Union, for $4.8 billion to a Netherlands-based Mittal Steel Co.

During 2005, lower commodity prices and political uncertainty hindered the investment climate in Ukraine. Economic growth stabilized during the final months of 2005, but domestic political tensions linger and may become more amplified as the country moves closer to parliamentary elections in late March 2006. The Ukrainian Parliament, or Rada, gave the current cabinet, led by Prime Minister Yuri Yekhanurov, a vote of no confidence on January 10, 2005. The cabinet is remaining in place in a caretaker status until after the March 26 elections.

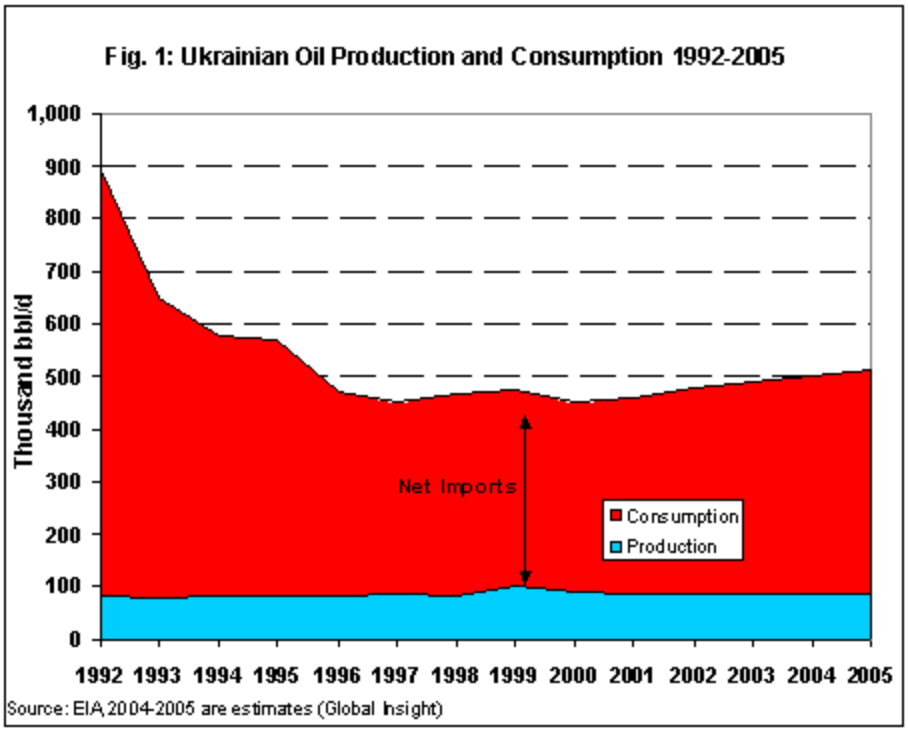
Oil

Ukraine is an important transit corridor for Russian oil exports. During 2005, pipelines in

According to the *Oil and Gas Journal*, Ukraine has 395 million barrels of proven oil reserves, the majority of these are located in the eastern Dnieper-Donetsk basin. Although Ukraine has made efforts at exploration, particularly in its sector of the Sea of Azov, oil production has remained relatively flat since independence (see Fig. 1). Consumption, on the other hand, has fallen

Ukraine carried 67 percent of oil from Russia into the European oil market.

dramatically, from 813,000 barrels per day (bbl/d) in 1992 to around 415,000 bbl/d in 2004 (see Fig. 1). Despite this decline in consumption, Ukraine remains highly dependent on imported oil, most of which comes from Russia and lesser amounts from Kazakhstan. In 2004, net crude oil imports totaled roughly 340,000 bbl/d, representing roughly 80 percent of consumption.



Oil Transit

Ukraine's geographic location makes it an ideal corridor for oil and natural gas to transit from Russia and the Caspian Sea region to European markets (see EU Ukraine Oil Map). According to Ukrainian oil ministry data, Ukrainian oil pipelines transported an average of about 934,000 bbl/d in 2005, a decrease of 15 percent from 2004. Some of the decrease in transit volumes was due to Kazakhstan choosing cheaper transit routes (such as the Baltic Pipeline System in northern Russia) for its crude oil shipments. Of the total, 627,000 bbl/d were transported to Slovakia, Hungary and the Czech Republic, down 4 percent from 2004. The amount of oil supplied to Ukrainian refineries fell 32 percent on the year to 306,000 bbl/d. Oil transportation via the Druzhba pipeline system increased 17 percent, to 480,000 bbl/d, in 2005. Oil transportation via the Prydniprovski Main Pipeline system fell 34 percent to 455,000 bbl/d.

As much as 1.6 million bbl/d eventually could be exported through Ukraine after a 15-year intergovernmental oil transit improvement agreement in 2003 comes to fruition. Most of the oil transited via Ukraine is Russian oil, sent in part through the 1.2-million-bbl/d capacity Druzhba pipeline. The southern fork of the pipeline runs through Ukraine (see map below). Also, the Prydniprovski Main Pipeline operates nine interconnected pipelines throughout Ukraine with a total length of 1,500 miles and a capacity of 2.1 million bbl/d. Prydniprovski transports crude to refineries in southern Ukraine as well as a substantial amount of Russian crude through Odessa on the Black Sea. Odessa loads approximately 192,000 bbl/d of Russian and Kazakh crude oil for export.

In 2001, Russia completed construction of a 160-mile pipeline that allows it to bypass Ukrainian territory. The Sukhodolnaya-Rodionavskaya line directly links two other pipelines and decreases oil flows through Ukraine by 500,000 bbl/d, or about 30 percent of Ukraine's total.

Brody-Odessa Reversal and Extension Project

Ukraine's government has made clear its goal of becoming a transit center for oil from the Caspian Sea region. Oil production from the region is expected to increase from 600,000-800,000 bbl/d over the next five years. One potential conduit for this oil in the Black Sea region is the Odessa-Brody pipeline. The pipeline was completed in 2001 and extends from Ukraine's Black Sea port of Odessa northward to the city of Brody (see "Proposed Pipeline Reversals" map below). The pipeline was initially intended to load 300,000 bbl/d of Caspian Sea oil from the newly completed Black Sea marine terminal, Pivdenniy (or Yuzhniy) and carry it northward through the Ukrainian system to Europe. However, for approximately three years the pipeline remained mostly dormant because Ukraine was unable to secure oil supplies from Caspian Sea area suppliers.

Russia is now using the pipeline in the reverse direction, moving oil from the Urals basin southwards to tankers in the Black Sea and onwards to world markets. Since January 2003, TNK-BP has used the last 32-mile leg of the pipeline (in reverse) for these purposes. corridor for oil and natural gas to transit

Faced with the possibility of losing direct access to Caspian Sea region oil, European governments have voiced their opposition to the reversal project in newspaper articles and public statements. Leading Caspian Sea region producer, Kazakhstan, has also taken counter-measures. In July 2003, for instance, Kazakhstan agreed to help construct a 32-mile pipeline parallel to the segment currently being used in reverse to transit Russian oil. In 2004, the Ukrainian government pledged that its final intent for the pipeline would be for it to flow from Odessa north to Brody. But while the pipeline sat idly, the Ukrainian state oil company UkrTransNafta, effectively reversed that decision, declaring that it had accepted an offer from the Russian-British company TNK-BP to ship 180,000 bbl/d from Brody south to Odessa (in reverse). On a temporary basis, in September 2004, the first tankers shipped from Odessa with Russian crude oil, and the 32-mile pipeline's initial capacity level was roughly 97,000 bbl/d. Total exports of oil from Odessa totaled over 500,000 bbl/d during 2004. (For more on the Caspian Sea Region's oil and natural gas potential, see EIA's Caspian Sea Region Country Analysis Brief)

If the pipeline does run in its originally intended direction, from Odessa to Brody, then Ukraine would like to extend the pipeline from Brody to Plock in Poland, and then Gdansk on the Baltic Sea. The European Bank for Reconstruction and Development (EBRD) has stated it may make more economic sense to construct the extension further to Wilhelmsaven, Germany, where it would avoid the crowded straits off the Danish and Swedish coast. Ukraine has yet to secure contracts for Caspian crude oil supply, and industry players have publicly stated that Caspian crude oil will be unlikely to displace cheaper Urals blend crude oil from Russia at central European refineries. Also, the refinery at Plock would have to be upgraded to accommodate the lighter quality Caspian crude. Currently, Ukraine and Poland are studying the feasibility of various extension plans, and the results are expected in the next several months.

Refining/Downstream

Ukraine has six crude oil refineries, with a combined throughput capacity of approximately 880,000 bbl/d. However, with domestic demand at just over 30 percent of the country's refining capacity, Ukraine's refineries are operating below capacity (around 69 percent in 2004, according to TNK-BP). Until recently, Ukraine's refineries did not even receive enough crude oil supplies to supply the country's domestic petroleum product demand.

Ukraine has begun to achieve better results in securing sufficient crude oil supplies for its refineries by offering oil exporters in Russia and Kazakhstan a stake in the country's refineries. Ukraine's recent success in privatizing its refineries has allowed the country to secure additional oil supplies to meet domestic demand, as well as to attract funds for necessary renovation work and to boost utilization rates at its refineries.

In early 2005, UkrTransNafta, which controls Ukraine's largest refinery at Kremenchug, announced a $1.7 billion modernization plan to boost petroleum product quality in line with EU quality standards. The largest component of the plan includes upgrading the Kremenchug refinery to improve gasoline quality and to lower sulfur content.

Natural Gas

Ukraine is a key transit center for

According to the *Oil and Gas Journal* Ukraine has roughly 40 trillion cubic feet (Tcf) of natural gas

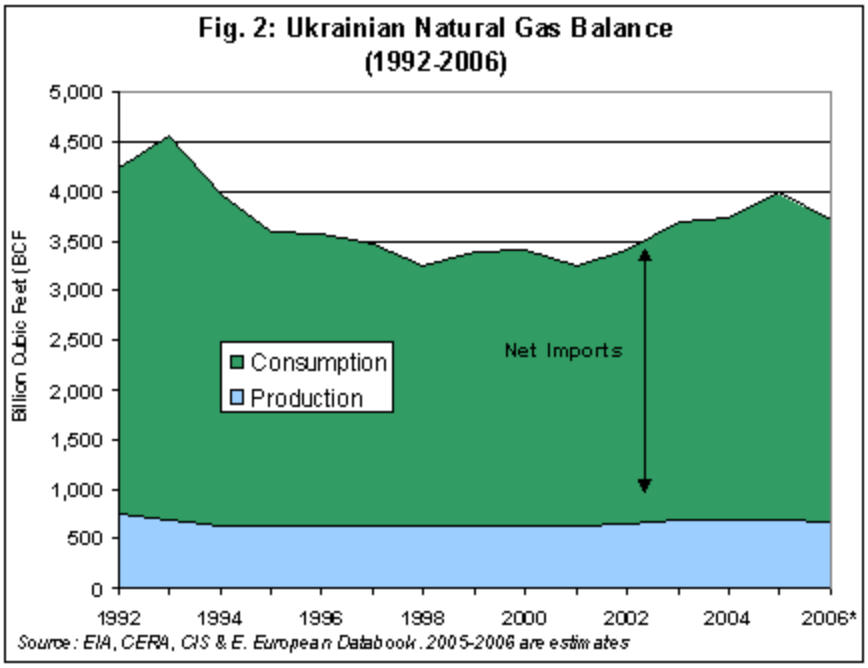
Russian natural gas exports to Europe. In order to provide reliable supplies domestically and in Europe more investment in the Ukrainian transport network, more international cooperation, and a more transparent energy sector are needed.

reserves, from which roughly 0.68 Tcf was produced in 2004. That year, the country consumed 3.1 Tcf of natural gas, making it the former Soviet Union's largest natural gas net importer (2.4 Tcf, or 78 percent of consumption, see Fig. 2). Ukraine is the sixth-largest consumer of gas in the world and consumes more gas than Poland, the Czech Republic, Hungary, and Slovakia combined. Since the early 1990s, Ukraine's usage of natural gas as a share of its total energy consumption has increased 10 percent to comprise over half of Ukraine's energy usage (see Fig. 5).

Historically, Russia partially supplied Ukraine via natural gas offered as payment in-kind for transiting Russia's gas onwards to Europe, and partially through annual sales contracts. In the past few years, Turkmenistan has become Ukraine's largest source of natural gas imports through long-term contracts. In May 2001, Ukraine and Turkmenistan signed an agreement calling for Turkmenistan to supply Ukraine with 8.8 Tcf/year of natural gas between 2002 and 2006. Leaders of Turkmenistan and Ukraine pledged to increase levels to around 14 Tcf/year for 2007-2032.

Ukraine holds 1.1 Tcf of natural gas in storage, and in January 2006 Prime Minister Yekhanurov announced a plan to increase the capacity at existing storage facilities to 1.2 Tcf by 2009. The six major facilities are located in the provinces of Lvov, Kiev, and Chernigov.

Fig. 2: Ukrainian Natural Gas Balance (1992-2006)



Source: EIA, CERA, CIS & E. European Databook. 2005-2006 are estimates

European Dependency on Russian Natural Gas

Ukraine plays a significant role to world energy markets as an intermediary connecting Russia, the world's largest natural gas producer, with growing European markets. Also, as gas exports from the Caspian to Europe and Russia grow, Ukraine serves as the largest market for this natural gas. Roughly 93 percent of Ukraine's natural gas imports are re-exported to world markets. Preliminary estimates for 2005 show that approximately 3.9 Tcf of Russian natural gas transited Ukraine en route to Europe. This represented roughly 29 percent of OECD Europe's natural gas imports and 78 percent of Russia's natural gas exports (see Table 1). The Ukrainian natural gas company, Naftogaz Ukrainy, also re-exports some of its contracted gas to the rest of Europe. During the first half of 2005, the company re-exported 78 Bcf and aimed to exports 177 Bcf for the entire year.

TABLE 1: Major European Recipients of Russian Natural Gas Exports, 2004

Rank	Country	Imports (bcf/year)	Pct of Domestic NG Consumption
1	Germany	1110	44%
2	Italy	777	29%
3	Turkey	473	65%
4	France	470	26%
5	Hungary	378	72%
6	Finland	269	100%
7	Slovakia	261	100%
8	Poland	258	60%
9	Czech Republic	240	82%
10	Austria	201	63%
11	Bulgaria	184	94%
12	Romania	177	24%
13	Fmr Yugoslavia	74	-
14	Greece	74	92%
15	Switzerland	18	17%

Others: (Belarus: 98%, Lithuania 100%, Latvia 100%, Estonia 100%)

Source: EIA, BP (2005), CIS and E. European Energy Databook, 2005

Europe's dependency on natural gas exports from Russia drew worldwide attention in January 2006 when a longstanding dispute over price and payment mechanisms in the in-kind agreements caused Gazprom to shut off gas supplies to Ukraine. Supplies to Europe were also affected. Even though Russia has used the threat of a cutoff to demand higher natural gas prices in recent years, this was the first time that a supply disruption affected flows to Europe. Eventually, Russia's natural gas company agreed to a sell its natural gas to RosUkrEnergo, a Zurich-based trading company 50 percent-owned by Gazprom at the market price of $6.51/mcf ($230 per thousand cubic meters). RosUkrEnergy will acquire some of the natural gas from Kazakhstan and Turkmenistan (see Table 2).

Table 2: Sources of Natural Gas for Ukraine's January 2006 Supply Agreement

Country Source	Amount (BCM/y)	Amount (BCF/y)	Acquired by	Price ($/MCM)*	Price ($/MMCF)*
Turkmenistan**	41	1449	Gazexport, Naftohaz Ukrainy	$ 65.00	$ 1.84
Uzbekistan	7	247	Gazexport	$ 65.00	$ 1.84
Kazakhstan	8	283	Gazexport	$ 65.00	$ 1.84
Russia	17	601	Gazexport	$ 230.00	$ 6.51
Total/Wtd.Average	**73**	**2,580**		**$ 103.42**	**$ 2.93**

* MCM: Thousand Cubic Meters, MMCF: Million Cubic Feet

**Naftohaz Ukrainy stated on 1/10/06 it will buy Turkmen gas for $50/mmcm in the first half of 2006 and $60 during the second half, but the final agreement's price was higher. Using the lower price for Turkmen gas, the wtd. average price is $97.8/MCM.

Source: Russian Energy Monthly, January 2006

On January 4, 2006, Ukraine signed a five-year agreement to buy 580 Bcf of natural gas from RosUkrEnergo at $2.69/mcf (comprised of less expensive natural gas from Central Asia). In 2005, Ukraine contracted to buy 812 Bcf at $1.41/mcf. In turn, Russia agreed to pay Ukraine natural gas transit fees of 7.3 cents per thousand cubic feet per 100 miles, a 47 percent price increase from 2005. The contracts are also subject to review each year and may be adjusted to new market prices. (See Table 2)

There are a few problems with the Ukrainian-Russian natural gas agreement. First, Turkmenistan will need to provide 3.3 Tcf of natural gas exports during 2006 to Ukraine, Iran, Gazprom, and its domestic market. This is 50 percent more than its export level during 2005. Turkmenistan's

exports during 2005 were only 7.6 percent higher than the previous year. Also, the contracted quantities for Gazprom's 1.1 Tcf are included in the 1.4 Tcf that Naftogaz Ukrainy has contracted to buy. In addition, half of the ownership of RosUkrEnergo remains undisclosed. The company will be responsible for the most complex part of the deal, which will involve the mixing of the natural gas volumes from different countries at various prices. Finally, the deal has solidified Russia's commitment to a contract price with Ukraine that is below full market value. In addition to shielding needed market signals, the below-market-value prices are causing other countries such as Georgia and Moldova to question their contracts with Gazprom.

The agreement also does not address Ukraine's high level of energy intensity or the country's need for energy diversification. The contract leaves the country's economy vulnerable to natural gas price increases. Natural gas accounted for 46 percent of the country's primary energy consumption in 2004. The World Bank forecasts that if gas prices double for Ukraine from their 2005 levels, then the country's GDP growth rate would fall to -1.8 percent this year from levels of 2.4 percent in 2005.

Transit Infrastructure

Ukraine's aging natural gas infrastructure is of growing importance and concern both to European consumers and Russian producers. Some of the pipes in the Ukrainian network have been in operation for 20-30 years, and repairs are rarely carried out because of a lack of available funds. In addition to pipeline disrepair, full capacity utilization is a problem. Roughly 1.4 Tcf per year of spare capacity is available on the system. An additional 1 bcf/year could be added through rehabilitation and upgrades of the existing infrastructure.

In June 2002, heads of state from Ukraine, Russia, and Germany, agreed to develop an international consortium called the OOO (Russian abbreviation for a Limited Liability Company) International Consortium for the Management and Development of the Gas Transport Network to manage and upgrade Ukraine's natural gas distribution infrastructure. In October 2002, Ukrainian and Russian state-owned oil and gas concerns, Naftogaz Ukrainy and Gazprom, signed preliminary agreements, and in January 2003, the new company was registered in Kiev, with each company holding 50 percent. The partners are still considering several proposals for the structure and membership of the Naftogaz Ukrainy/Gazprom consortium. Germany's Ruhrgas has been present at the consortium's negotiations, but its role remains unclear. Several other parties have shown interest in the consortium, including Gaz de France and the EBRD.Ukraine has also suggested inviting other Caspian Sea region producers Turkmenistan, Kazakhstan, and Azerbaijan to participate.

In February 2006, a Ukrainian-Russian joint-venture will begin construction of the first stage of a natural gas pipeline that will increase Ukraine's transport levels to Western Europe. The joint venture was formed in 2004 between Naftogaz Ukrainy and Gazprom. The construction of the $2.2-$2.8 billion pipeline from Uzhorod to Novopskov on the border with Slovakia will be completed by 2009. Construction of the initial section of the pipeline was postponed from 2005 to February 2006 and will take approximately two years to complete. The completed pipeline will have a capacity of roughly 670 Bcf per year and will permit a 25 percent increase in the flow of Russian natural gas to Europe. Ukraine is guaranteeing a zero tax rate on gas flows through the pipeline until the joint venture receives a positive return on investment.

The joint venture also has plans to construct a new pipeline from Alexsandrov Gay on the Russian portion of the Central Asia Center system to Novopskov in eastern Ukraine. This will aid in the transit of Turkmen natural gas to Ukraine.

Coal

Ukraine has sizable resources of coal, but equipment problems and lax safety measures and have created dangerous work conditions.

Ukraine has 37.6 billion short tons in proven coal reserves, 17.9 billion short tons of which is anthracite and bituminous coal, and 19.7 billion short tons of which is lignite and sub-bituminous), accounting for about 15 percent of the former Soviet Union's total reserves. Production and consumption of coal in Ukraine have been relatively flat since 1996, after a precipitous falloff in production after gaining independence. In 2003, the country produced 63.5 million short tons of hard and brown coal, while consuming roughly 67 million short tons, making Ukraine a net coal importer, despite its sizeable resources.

Most of Ukraine's coal is mined in the Donetsk/Donbas basin in the eastern region of the country. The country's coal industry, which counts slightly less than 200 mines and employs about 500,000 people, is managed by a hierarchy of state organizations and suffers from numerous problems including: labor strikes, hazardous working conditions, inefficiency and low productivity. Since Ukraine's independence in 1991, there have been over 4,300 deaths in the country's mines, making them among the most dangerous in the world.

Ukraine's government has made restructuring the coal industry a priority, and in December 2002,

the Fuel and Energy Ministry announced plans to hand the industry over to 21 open joint-stock companies designed for eventual privatization. In the past, the industry was heavily subsidized by the government, with over half of the mines operating at a loss. After the handoff was completed in March 2003, privatization still proceeded slowly. The World Bank has provided over $300 million to aid in the coal sector's restructuring since 1997. In addition to calling for management restructuring, the program also calls for improving the average ash content of the coal from 23.1 to 22.7 percent. A sizeable portion of the money has gone to aid in the closure of the unprofitable mines, yet the country has been reluctant to close them in regions where there are few other job sources.

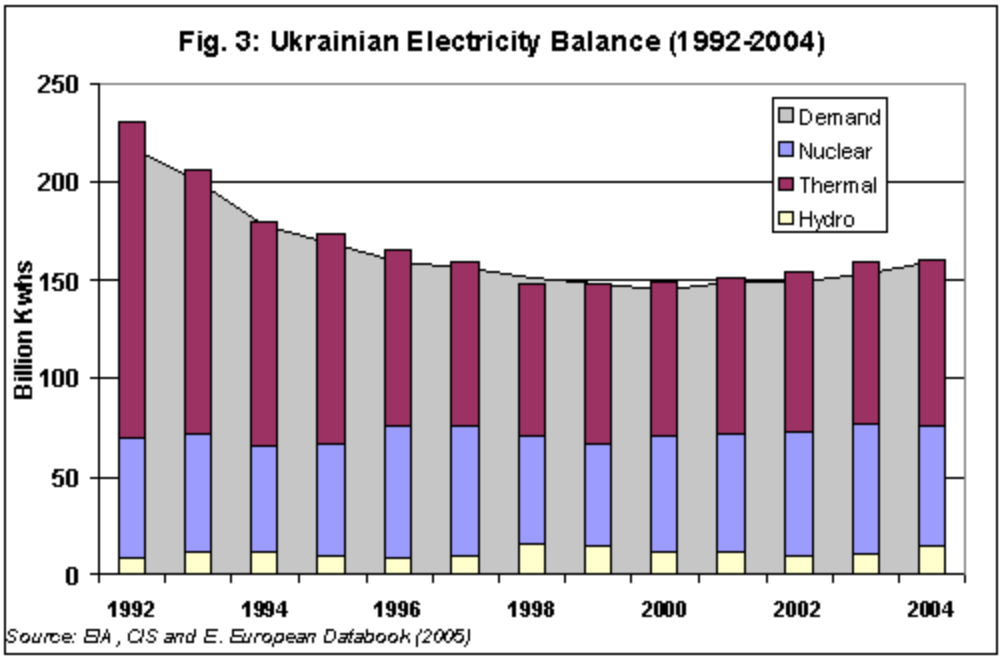
Electricity

Ukraine has sufficient generating capacity to supply more than twice its electricity needs, but the country's ageing infrastructure is in need of investment and maintenance.

Ukraine's power sector is the twelfth-largest in the world in terms of installed capacity, with 54 gigawatts (GW). Generation and consumption fell sharply since independence, but they have increased since 2000 (see Fig. 3). According to preliminary data for 2004, Ukraine generated 177 billion kilowatt hours (kWh) of electricity. The country is currently in the process of revamping its electricity sector, through privatization, increased utilization at existing facilities, and the completion of two new nuclear plants (see below).

In Ukraine, thermal power plants (oil, natural gas, coal) account for nearly 50 percent of generation, with nuclear power generating another 40 percent, and hydroelectric generation accounting for approximately 10 percent (see Fig. 3). Ukraine has sufficient generating capacity to supply more than twice its electricity needs. However, the country's transmission and distribution systems are in need of investment and maintenance, and significant quantities of generation are wasted via line losses. Also, several of the country's nuclear facilities are intermittently shut down throughout the year for technical problems.

With the surplus electricity, Ukraine exported approximately 2.8 billion kWh to Russia from January to July 2005. After the completion of two new nuclear reactors (see below), Ukraine signed a deal with UES, Russia's main electricity supplier, to supply 500 million kWh of power per month to Russia at a price of $.014/kWh. After an increase in Ukrainian export tariffs. Ukraine's wholesale electricity operator, Energorynok, increased prices by 77 percent, to $0.024 per kWh for electric power purchases on Ukraine's domestic market, prompting the State Committee for Nuclear Regulation to decide to suspend power exports to Russia because it was no longer economically feasible.



Exports

State-owned UkrInterEnergo exports Ukrainian electricity to other markets. During 2004 (latest data available), the company exported 5.14 billion kWh to other countries. Ukraine signed a contract to supply 2.5 billion kWh to Belarus during 2006 and stands to make $50 million from the contract. Ukraine also exports electricity from the Burshtyn thermoelectric power station to Moldova, Slovakia, Poland, and Hungary. It started exporting electricity to Romania in March 2005. The Burshtyn thermoelectric power station and part of Ukraine's western energy system

have been connected to UCTE energy system of Europe since July 2002. EU officials met with Ukrainian energy officials in Kiev in early 2006 to discuss plans to fully integrate Ukraine's electricity grid into the UCTE by 2008.

Nuclear

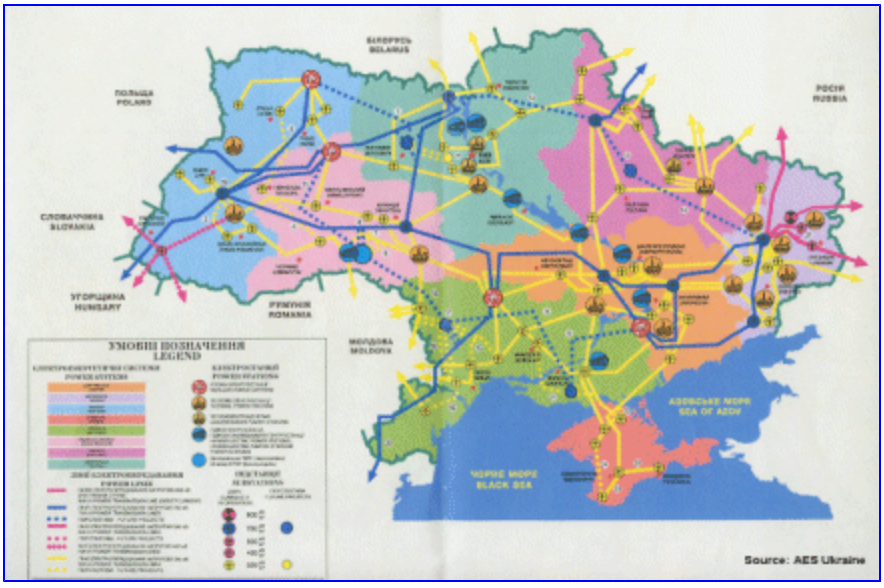
Ukraine currently has four operating nuclear power plants. These plants have a combined capacity of 12.8 gigawatts, accounting for approximately 24 percent of the country's total power-generating capacity. Ukraine's nuclear plants produced 40 percent of the country's power in 2004, despite frequent malfunctions and lengthy repairs and maintenance.

On December 15, 2000, Ukraine permanently shut down the 925-MW, Unit 3 at the Chernobyl power plant, disabling the last remaining working reactor at the ill-fated facility. To replace the power generated by Chernobyl, which Ukrainian officials say accounted for approximately 5 percent of the country's total, Ukraine resumed construction of two 1-GW reactors at the Khmelnitsky and Rivne power plants. The construction of Khmelnitsky Unit #2 and Rivne Unit #4 began under the Soviet Union, and both were more than 80 percent finished when Ukraine received its independence and ran out of money to complete them. After financing from the EBRD was placed on hold, the Ukrainian government announced its intentions to complete the reactors on its own, without EBRD involvement. Environmentalists and others criticized the plan as unnecessary, given Ukraine's existing overcapacity. Khmelnitsky Unit #2 and Rivne Unit #4 were connected to the electricity grid in August and October 2004, respectively. Serhiy Touloub, the Ukrainian energy minister, announced plans in October 2004 to construct two additional nuclear reactors at the plants at a cost of $1 billion each.

Regulatory Structure

During President Yushchenko's previous administration in 2000/2001, privatization of the electricity sector was one of his key objectives and resulted in the sale of six distribution companies. AES, based in the United States, won 2 of the 6 tenders and is now the only foreign investor in the sector. Currently, only six Ukrainian distribution companies have been fully privatized, and 20-45 percent stakes in nine other utilities were sold in 1997-1998. Further privatization of the sector is not currently planned. Since 1997, the Ukrainian National Electricity Regulatory Commission (NERC) has facilitated a centralized market for wholesale electricity, called the Wholesale Electricity Market (WEM). Power producers sell into a common market, operated by Energorynok, and distribution companies distribute the power to the end user. Although the government fixes the price of nuclear and hydro generation supply, the market has made progress in basing wholesale electricity prices on an upcoming hour's and an upcoming day's basis by using its bidding cost of electricity production. The tariff methodology was determined in 2001 for privatized utilities concurrent with the sale of controlling stakes in six utilities.

Map of Ukrainian Electricity Sector (click below for detail)



Other problems hinder the full development of a deregulated market in Ukraine. First, there is a high level of transmission losses; in recent years, these have increased from 8 percent to 17 percent (compared to around 3 percent in the United States, see Fig. 5). Again, only six of those

companies have begun the process of privatization, and the Ukrainian government has been reluctant to give new buyers more than a minority stake in the companies. There are also worries that the government will not receive enough compensation for the sale. Also, the industry itself is in debt from a long history of problems which stem from insufficient collection mechanisms during the 1990s. Distribution companies owe $3 billion in debt to the wholesale market. The combination of poor networks, high losses, corruption, and pressure to keep current tariffs low has created inefficiencies in the market and muted the necessary price signals.

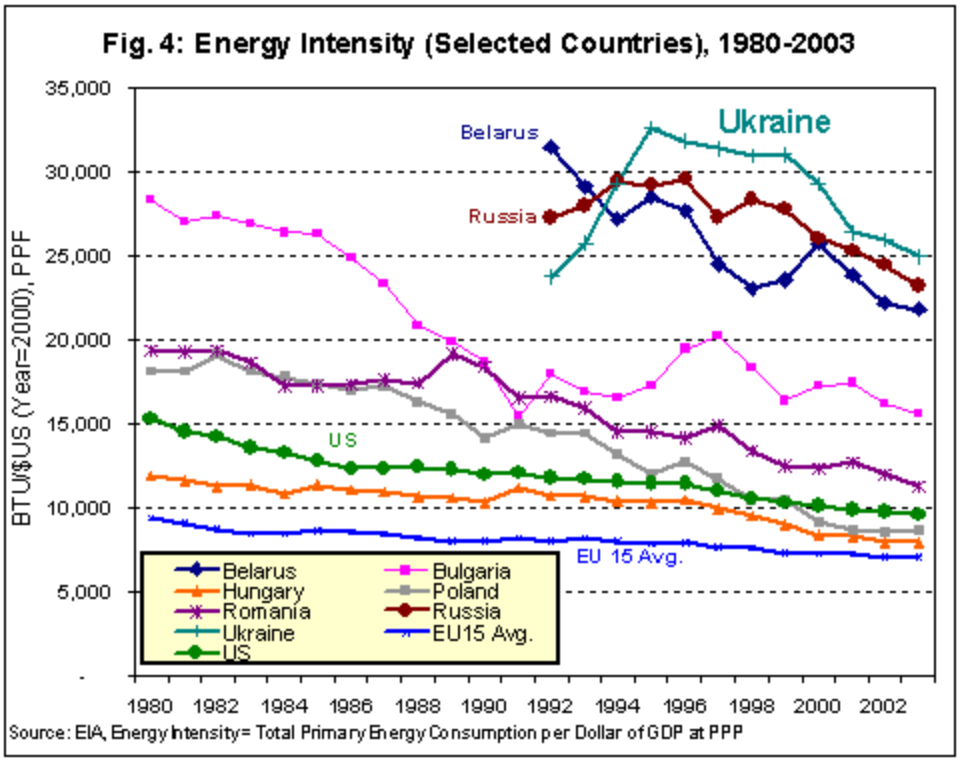
Despite all these obstacles, market operators have made some progress. In 1999, cash payments for electricity purchased in the wholesale market represented only 7-10 percent of the actual value of electricity. By 2005, most distribution companies were paying back 100 percent of their electricity purchases and were beginning to pay back debt.

Environment

The Chernobyl nuclear meltdown had disastrous consequences for the environment in Ukraine. The country has one of the highest energy intensities in the world and has made some progress in reducing its energy usage from oil and coal but not for natural gas.

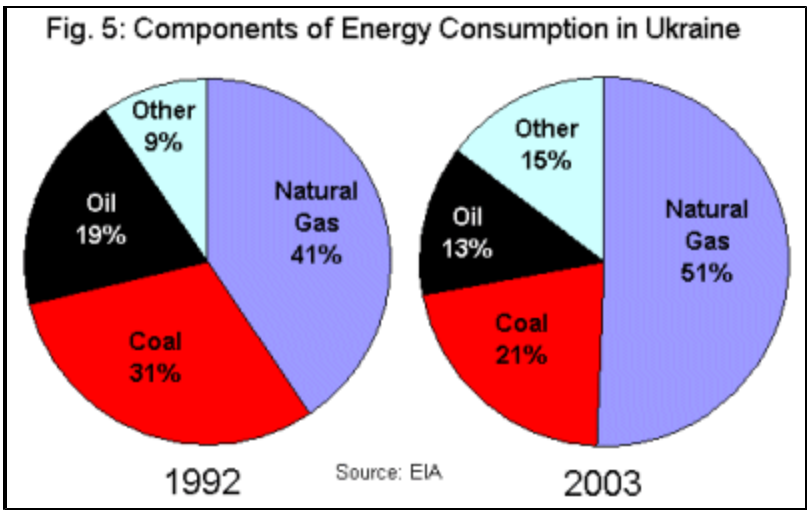
The 1986 Chernobyl nuclear meltdown exposed the Soviet Union's negligent environmental record and triggered alarm across the globe. The world's worst nuclear accident created disastrous consequences for the environment, both in Ukraine and in neighboring countries. As a result, Soviet policies that encouraged industrial development at the expense of the environment came under harsh international criticism, and Chernobyl became a rallying cry for environmentalists around the world. Recently, however, the United Nations recently released a report saying that the long-term impacts of the disaster have not been as severe as originally expected.

Although Chernobyl remains the lasting symbol of environmental degradation in Ukraine, today air pollution in the major cities is a major problem. Increased vehicle traffic and sales caused higher carbon dioxide emissions in the early 1990s. Today, energy use is lower in part to policies encouraging energy conservation and energy efficiency, but Ukraine's economic woes account for much of the reduction. As the economy contracted through the 1990s, industrial production and consumer demand dropped as well, resulting in lower carbon dioxide emissions. Ukraine's recent economic growth has led to increases in both carbon dioxide emissions and energy consumption (see Fig 4).



In terms of energy consumption per unit of output, Ukraine has one of the highest levels of energy intensity in the world. Its consumption of natural gas as a percentage of its total energy consumption has also increased since 1992 and now represents over half of its energy usage. (see Fig. 5). The country's heavy dependence on coal makes it correspondingly high in carbon intensity, although Ukraine still generates over 50% of its electricity from nuclear sources. The government has made some progress and passed a bill to encourage alternative energy sector development through tax rebates for companies seeking to develop solar, geothermal and wind power projects. Former-President Kuchma signed the bill in 2001. Also, Ukraine is a member of

the U.S.-led, international Methane to Markets Initiative that pledges to reduce global methane emissions.



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Maps

U.S. Government Maps:

FSU Energy Map (click for a high resolution version):

(Source: CIA)

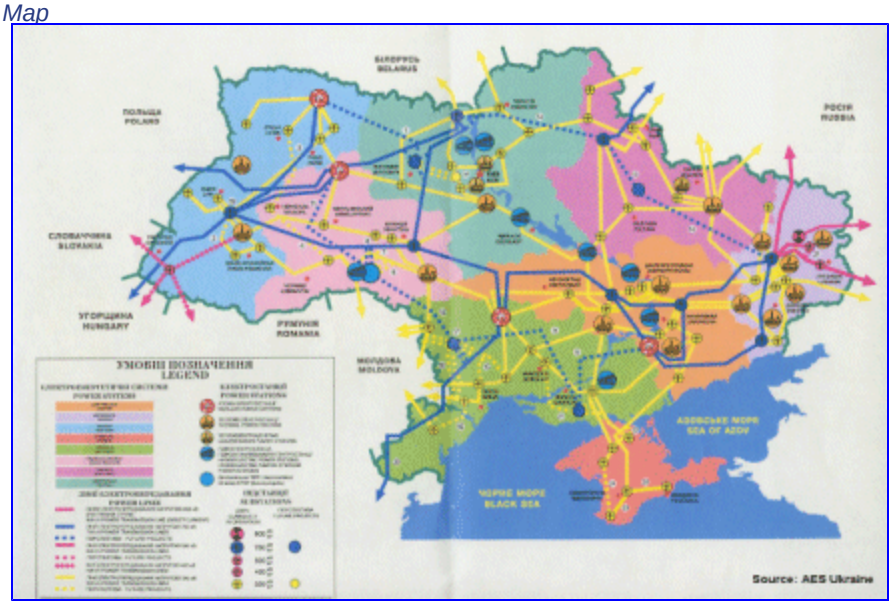
Major Pipelines to Europe:

(Source: CIA)

Bosporus Bypass Options (please click below for a full map)

Other Non-U.S. Government Maps:

Ukraine Electricity Map



(Source: AES)

Profile

Country Overview

Chief of State	Viktor Yushchenko
Prime Minister	Yuri Yekhanurov
Location	Eastern Europe, bordering the Black Sea, between Poland, Romania, and Moldova in the west and Russia in the east
Independence	24 August 1991 (from the Soviet Union)
Population (2005E)	47,425,336
Languages	Ukrainian (official) 67%, Russian 24%; small Romanian-, Polish-, and Hungarian-speaking minorities
Religion	Ukrainian Orthodox - Kiev Patriarchate 19%, Orthodox (no particular jurisdiction) 16%, Ukrainian Orthodox - Moscow Patriarchate 9%, Ukrainian Greek Catholic 6%, Ukrainian Autocephalous Orthodox 1.7%, Protestant, Jewish, none 38% (2004 est.)
Ethnic Group(s)	Ukrainian 77.8%, Russian 17.3%, Belarusian 0.6%, Moldovan 0.5%, Crimean Tatar 0.5%, Bulgarian 0.4%, Hungarian 0.3%, Romanian 0.3%, Polish 0.3%, Jewish 0.2%, other 1.8% (2001 census)

Economic Overview

Minister of Economy	Arsenii Yatseniuk (acting)
Currency/Exchange Rate (3/1/06)	US $1=5.05 hryvnia
Inflation Rate, Change in consumer prices year-on-year	(2004E): 9.0%; (2005E): 13.5
Nominal Gross Domestic Product (GDP), $US Billion	(2005E): 80.1,(2006F): 93.3
Real GDP Growth Rate	(2005E): 2.4%, (2006F): 4.5%
Unemployment Rate (2005)	3.1% (official estimate)
External Debt (2005)	$18.1 Billion
Exports (2005)	$10.9 Billion
Exports - Commodities	ferrous and nonferrous metals, fuel and petroleum products, chemicals, machinery and transport equipment, food products
Exports - Partners (2005E)	Russia 17.4%, Turkey 7.1%, Italy 5.7%

Imports (2005)	$17.1 Billion
Imports - Commodities	energy, machinery and equipment, chemicals
Imports - Partners (2004E)	Russia 31.9%, Germany 11.9%, Turkmenistan 5.8%, Italy 4.5%
Current Account Balance (2005)	$2.14 Billion

Energy Overview

Minister of Fuel and Energy	Ivan Plachkov
Proven Oil Reserves (January 1, 2006E)	0.4 billion barrels
Oil Production (2005E)	86.1 thousand barrels per day, of which 87% was crude oil.
Oil Consumption (2005E)	406.7 thousand barrels per day
Net Oil Imports (2005E)	320.6 thousand barrels per day
Crude Oil Distillation Capacity (2006E)	879.8 thousand barrels per day
Proven Natural Gas Reserves (January 1, 2006E)	39.6 trillion cubic feet
Natural Gas Production (2003E)	700 billion cubic feet
Natural Gas Consumption (2003E)	3,023 billion cubic feet
Net Natural Gas Imports (2003E)	2,323 billion cubic feet
Recoverable Coal Reserves (2003E)	37,647.2 million short tons
Coal Production (2003E)	63.5 million short tons
Coal Consumption (2003E)	67.2 million short tons
Electricity Installed Capacity (2003E)	52.9 gigawatts
Electricity Production (2003E)	169.9 billion kilowatt hours
Electricity Consumption (2003E)	153.1 billion kilowatt hours
Total Energy Consumption (2003E)	6.3 quadrillion Btus*, of which Natural Gas (48%), Coal (21%), Oil (13%), Nuclear (13%), Hydroelectricity (2%), Other Renewables (0%)
Total Per Capita Energy Consumption (2003E)	128.9 million Btus
Energy Intensity (2003E)	24,940.8 Btu per $2000-PPP**

Environmental Overview

Energy-Related Carbon Dioxide Emissions (2003E)	345.9 million metric tons, of which Natural Gas (48%), Coal (35%), Oil (16%)
Per-Capita, Energy-Related Carbon Dioxide Emissions (2003E)	7.1 metric tons
Carbon Dioxide Intensity (2003E)	1.4 Metric tons per thousand $2000-PPP**
Environmental Issues	inadequate supplies of potable water; air and water pollution; deforestation; radiation contamination in the northeast from 1986 accident at Chornobyl' Nuclear Power Plant
Major Environmental Agreements	party to: Air Pollution, Air Pollution-Nitrogen Oxides, Air Pollution-Sulfur 85, Antarctic-Environmental Protocol, Antarctic-Marine Living Resources, Antarctic Treaty, Biodiversity, Climate Change, Climate Change-Kyoto Protocol, Endangered Species, Environmental Modification, Hazardous Wastes, Law of the Sea, Marine Dumping, Ozone Layer Protection, Ship Pollution, Wetlands signed, but not ratified: Air Pollution-Persistent Organic Pollutants, Air Pollution-Sulfur 94, Air Pollution-Volatile Organic Compounds

Oil and Gas Industry

Organization	Naftogaz Ukrainy is the state oil company, and is involved in almost all oil and gas projects in the country. With the exception of Gazprom, there are very few foreign investors in Ukraine's energy industry.
Major Oil/Gas Ports	Odessa (Pivdenny), Feodosiya, Sevastopol, Mariupol
Major Oil Pipelines (capacity, MMBD)	Druzhba (1.2), Prydniprovski Main Pipeline (2.1), Brody-Odessa (180 initially, 500 eventually)
Major Natural Gas Pipelines (capacity, Tcf)	Northern Lights, Progress, Soyuz, Brotherhood - all 1 Tcf
Major Refineries (capacity, bbl/d)	Kremenchuk (372,000), Lisichanksk (320,000), Kherson (118,000), Halychyna/Drohobych (86,000), Odessa (80,000), Naftokhimnik Prykaprpattya (50,000)

* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar, wind, wood and waste electric power. The renewable energy consumption statistic is based on International Energy Agency (IEA) data and includes hydropower, solar, wind, tide, geothermal, solid biomass and animal products, biomass gas and liquids, industrial and municipal wastes. Sectoral shares of energy consumption and carbon emissions are also based on IEA data.
**GDP figures from OECD estimates based on purchasing power parity (PPP) exchange rates.

Links

EIA Links
EIA: Country Information on Ukraine

U.S. Government
U.S. Agency for International Development
U.S. Department of Commerce, Business Information Service for the Newly Independent States (BISNIS)
U.S. Department of Commerce, Country Commercial Guides
U.S. Department of Commerce, International Trade Administration: Energy Division
U.S. Department of Commerce, Trade Compliance Center: Market Access Information
CIA World Factbook
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Ukraine Ministry of Fuel and Energy
Ukraine Ministry of Economy

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U.S. Energy Information Administration

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